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Game Laws for Ferns and Wild Flowers.

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During the year 1921, the state of Vermont passed a law for the protection of native wild plants, specifying some twenty odd species of flowering plants and several of ferns. (See list appended at end of article.) The law provides, among other things, that these plants may not be collected for commercial exploitation and that a botanist may collect no more than two specimens of any plant on the list in a given season. The particular ferns listed are all among the less common sorts, mostly rare alpine species. Here is a first general "game law" for plants. It is worth some detailed consideration. What is the present need for such a law, in Vermont, and in other states? It will be worth while to consider the topic in a broad way, covering not only the Vermont situation but also the whole matter of wild plant conservation in general. It is hoped that this general consideration may call forth the expression of observations and opinions from as many viewpoints as possible; that the rather general outlines here presented may be filled in accurately.

In May, 1921, the Massachusetts Horticultural Society held an exhibition in Boston of native wild orchids. The exhibition as set up occupied one large room in Horticultural Hall, and was presented by the president of the Society, Mr. Albert C. Burrage. For the

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occasion the room was transformed into a similitude of a New Hampshire corner, with a bit of lake in the center, surrounded by a lush growth of the showy lady slipper, perhaps one hundred and fifty individuals, and other attractive wild plants, including about twenty-five different wild orchids. These had mostly been dug up the preceding season, held over winter, and forced into flower in greenhouses. At first scheduled as a four day exhibit, the interest it aroused caused a week's extension. Twenty-two thousand people were recorded as visitors. At a similar exhibition held this spring, over seventy thousand attended. Think, estimate if you can, the effects of thus presenting nature in its sheerest loveliness to so great a multitude of people. We of the Fern Society number a bare three hundred of nature lovers, meeting in the pages of the Fern Journal to share our common interests, and, in twos and threes, meeting in actual visits to the haunts of the ferns we study. What are we doing to promote the wider knowledge and understanding of native ferns? To pass on to others, to convert others to the same understanding and love of outdoors? Surely, if so many thousand people cared to visit these two exhibitions of native flowering plants set up in the manner of outdoors inside a brick building, we fern lovers of the whole broad continent of America, with the wealth of mountain, forest, glade and glen, canyon, meadow, stream, pasture, even desert, from Alaska and Greenland to the jungles of Panama, we have something to contribute that multitudes need and want; not merely one wild corner from one state, but innumerable vistas of beauty, the remembrance of which thrills and tingles.

"There are few things so broad as a 'narrow specialty' if you will follow it down to the ends of its wide-spreading roots!"¹

¹ Edward S. Nichols, in an address at the laying of the cornerstone of the chemical laboratory of Cornell University.

What do particular fern species recall to you? I see a leaf of hart's tongue and am transported to central New York, to the glacial lake basins, the fossil waterfalls, near Jamesville, back twenty years to my first find of this fern as a boy. I see limestone cliffs, blue-green water; white cedar thickets which had to be broken through and which I can feel vividly. I see a leaf of the mountain *dilatata*, and climb again Blue Mountain in the Adirondacks, to a view of sixty lakes, to a bed on balsam. The royal fern means lakes and streams: Onondaga, of Indian legend, with black mucky woodlands, mosquitoes, the royal fern six feet high; or I am driving a light guide boat through an Adirondack lake and meander, rowing past bright yellow patches of this fern in a heath background of September, to carries over which the boat, oars and pack must be toted various distances. Goldie's fern calls back rich woodlands, open sunlit undergrowth with the glint of spotted light and shade, parked stretches of great beeches and birches, with silver and golden bark. With Goldie's fern usually were found two or three other species, not to be had in every woodland, the silvery spleenwort, the narrow spleenwort, and sometimes, nearby, the dainty oakfern.

The Massachusetts fern, first seen within the city limits of Greater New York, carries also a much more attractive association of memories: around Quiver Pond in the Adirondacks, along an old abandoned corduroy road of former lumbering operations, leading to a cached canoe hidden by a beaver dam. Here was trout fishing along a section of Third Lake Creek from which the engineering operations of the beaver had barred wading or fishing from the banks. Here, again, was the thrill of unexpected turnings, of alder-choked stretches barely wide enough for the canoe, of surprised beaver, not to forget the trout caught and the ones that got away.



"GOLDIE'S FERN CALLS BACK RICH WOODLANDS"

For many, Goldie's fern, Braun's holly fern, the fragrant shield fern and others must recall Smugglers Notch in the Green Mountains of Vermont, with all the lure which mountains offer; but Smugglers' Notch must lack a particular charm if Goldie's fern is gone, just as New England pastures lose luster when the laurel is stripped from them to decorate some private backyard, no matter how large and glorified. They tell us that these ferns are no more there, that Smugglers' Notch has been despoiled of these and other rare plants. So, for the state at large, we have as a result the 1921 conservation law. In time, Goldie's fern, the wall rue, the Woodsias, Calypso, the ram's head lady slipper, and the rest should come back again, but in the meantime, will not the beauty spots of other states lose some of their choicest gems? What can be done?

The problem involves a consideration of the various circumstances and industries which threaten the existence of our rarer wild ferns. We shall find some of these dangers partly unavoidable but others with some possibility of amelioration.

The depletion of the Vermont flora seems mainly to have been due to the activities of collectors for firms which make a business of selling live plants. Many of us have had their catalogues and may have ordered a few plants of species not available in our own immediate neighborhood, without realizing the consequences. The case for this industry is thus stated in a letter from one of the best known dealers in wild plants and one who has been held largely responsible for the extinction of Goldie's fern at Smugglers' Notch: "It is true that for thirty years, up to within the past few years, I have been gathering material from Smugglers' Notch. I have not, however, in all that time taken over two hundred *Aspidium Goldianum* and a larger number of *Aspidium Braunii*. During all my years of collecting

there I have never before had my right questioned to take them: in fact this territory up to within a comparatively short time has been owned by private individuals who have given me the right to gather these things. During my collecting it has not been my intention to exterminate or deplete materially any of these rare things but just now there seems to be an agitation which is pointing me out as a robber of the woods. I will ask you as a fair minded person and one undoubtedly familiar with native plants whether the work I have been doing has not added more to the enjoyment of the many, than to have left these ferns where they were naturally growing to be killed out by natural causes and by vandalism. These two varieties I have sent to all sections of the United States and many of the purchasers I think now have them growing on their own grounds, and many of these could not have enjoyed them had they been obliged to go to their natural habitat.

"I am not offering this as an excuse for what I have done, yet I think there are two sides to this question; furthermore, I have distributed spores of these rare ferns in a great many places where I have been and undoubtedly many of them have germinated and in years to come many more ferns will be found.

"I assure you I am very much interested in protecting our native flowers in general. Personally I have taken very few of these plants from the woods but have depended on those who are established in the *business of collecting in various sections of the country*. While legislation can do very much to prevent the taking of rare varieties I think it can never stop the gathering of native material as people who are interested in wild flowers are bound to get out into the woods and gather them for themselves. I think the real way to protect our native flora is to interest people so that they will

start wild flower gardens of their own."

"It is true that I have grown ferns from spores and have grown the two varieties you have mentioned, yet *it is impossible to grow all these ferns in sufficient quantity to supply the demand.*"²

Replying to the above letter, the following comments were made: "I can readily see that the idea of bringing the woods to peoples' backyards by serving to distribute various kinds of ferns and wild flowers not easily accessible would appeal to one interested in wild plants and and in gardens also. But I am sure you will also see that if, despite your conservative collecting, ferns formerly abundant, as *Dryopteris Goldiana* at Smugglers' Notch, have been practically exterminated there, the possible good of distributing such plants has been more than counterbalanced by their destruction in natural surroundings. If you succeed in further stimulating the growing of wild ferns, say specifically *Goldiana*, in backyards, etc., it will not be long before the wild supply will have been entirely exhausted. And what is true for one species is of course true for others also." Parenthetically, let me interpolate the further comment that the mortality of the Goldie and other ferns and wild flowers will be extremely high in the average home garden.

It seems to me that we may reach certain general conclusions with respect to the sale of wild ferns and flowering plants.

1. There will always be some kinds so common, so plentifully reproduced, that nature may be depended upon to supply any probable commercial demand.

2. There will be others, less common, like *Goldiana*, which cannot stand commercial distribution, although they would be able to keep pace with less extensive

² Italics in this letter by the editors.

collection by private individuals for their own gardens. It seems to me that the sale of such species should be restricted to artificially raised plants, not at all a difficult problem.

3. There are still other ferns, like native hart's tongue, the rarer woodsias, the climbing fern, and various orchids, et al., whose sale should perhaps be prohibited altogether, unless their artificial cultivation and reproduction is demonstrated to be easily feasible. In other words, rarer ferns and flowering plants need to be treated as are the birds which are divided into protected and unprotected lists. Horticultural societies would do well to encourage the exhibition of artificially raised examples of interesting wild plants. Lovers of wild plants in various states should ask their respective legislatures to follow the example of Vermont in establishing protected lists of plants, the sale of which should be restricted to supplies artificially propagated.

Aside from commercial collection, other dangers threaten our wild fern flora. A year ago, April 7, 1921, President Harding issued a proclamation including the following statements: "The destruction by forest fires in the United States involves an annual loss of approximately \$200,000,000 and the devastation of approximately 12,500,000 acres of timberland and other natural resources, and the present deplorably large area of non-productive land is being greatly increased by 33,000 or more forest fires which occur each year," The conservation of forest loving ferns is thus indicated as included in the general forest conservation problem.

Mr. Weatherby has pointed out that in the Hartford section the climbing fern is partial to soils and situations very well suited for the culture of tobacco, and the best stands of *Lygodium* are even now being destroyed. Similarly, with the gradual drainage of large swamps for

agriculture, the homes of such ferns as *Woodwardia*, and of many choice orchids will be requisitioned.

The threatened destruction of the hart's tongue near Jamesville, N. Y., by quarrying interests illustrates another danger. To some extent, the hart's tongue situation has been helped by the establishment of the Clarke reservation around West Green Lake, including as it does, several plots of ground where this fern is fairly abundant. But parks of this sort carry their own danger, for with the influx of larger and larger numbers of people, the danger to rare plants is obvious.

A not inconsiderable danger threatening rare plants is due to people who should be the first to guard against the destruction of any plant habitat. I refer to the collecting botanist who either thoughtlessly or selfishly, in order to fill his collections, does not hesitate to take the last growing plant of some rare species. An interesting example of this occurred in Syracuse some twenty-five years ago. Within the city limits, a small sphagnum swamp had formerly been the habitat for arbutus, the ram's head lady slipper, and others. An attempt was made to reestablish arbutus by transplantation from another locality, but within a year an enthusiastic local collector, brought the transplanted arbutus as an herbarium specimen to the man who had re-introduced it.

The above outline of the different agencies causing the destruction of rare wild plants carries in general for each danger the possibilities of protective action. Against the invasion by agricultural and quarrying interests, there are apparently only two practicable means: first, it would be worth while to work for the establishment of reservations of selected regions noteworthy for their rare plants. If such regions can be made extensive enough to include a wide range of park land, there will be less danger from the invasion of the

uninformed than if the reservation is more limited. The Clarke Reservation west of Jamesville is a case in point; other localities should have been included. A special type of reservation is probably desirable, along the lines of the bird sanctuaries, which are being established in different parts of the country and to which reference has already been made in an earlier Fern Journal by Mrs. Britton. Such sanctuaries, of limited area, could well be maintained by local communities, with constant protection, as part of their educational facilities. A sanctuary of this type at Fairfield, Conn., is an excellent case in point. The only other means of preventing the destruction or depletion of rare plants when threatened by agricultural, quarrying, or lumber interests, would seem to lie in the transplantation of such rare plants to other favorable localities in less danger of invasion.

With reference again to the commercial collection and sale of living plants, the suggestion is repeated that some such list of protected plants as is represented in the case of the Vermont law, should be drawn up for each state. The list, of course, would not be the same throughout the country. Nature societies locally interested should be the activating agencies in securing the passage of such laws. In general I believe the practice will also be to a considerable extent self-corrective in the fact that the continued exploitation of a rare species will eventually reduce the available stock to such an extent that it will not be practicable to market. Before this happens, however, it is to be hoped that the commercial collectors, who undoubtedly generally have as keen an interest in plants as amateur or professional botanists, will see the matter from the standpoint of the future. In the case of ferns, there does not seem to be any reason why the most decorative species cannot be grown in commercial quantity artificially. Our native hart's tongue, Goldie's fern, and most of the

others which do not require extreme heat all winter, may be readily raised from spores under economic greenhouse conditions.

In the preceding case as in the case of a amateur and professional botanists, or the plant lover who merely collects a few plants for the home garden, the strongest appeal should lie in the basic interest of all these types of people in plants themselves. It is probable that the collection even of some of the relatively uncommon ferns like the Goldie Fern by private individuals in sufficient numbers for their own gardens will never seriously endanger the supply; it is only when some wealthy individual establishing a private estate orders single species of ferns by the thousand. It is difficult to see just what practical measures can be taken against the individual botanical collector who collects so extensive a set of specimens of any given plant that its existence in a given locality is threatened.

Certain evergreen species of ferns have furnished the basis for another industry of considerable importance, i. e., the collection of their leaves to use with bouquets of flowers, already very adequately discussed in the Fern Journal by Mr. Burnham (vol. 9, pp. 88-93). Three of our common species seem to be involved, the so-called fancy fern (*Dryopteris intermedia*), the Christmas fern, or to give it its trade name, the dagger fern (*Polystichum acrostichoides*) and to a lesser extent the evergreen or marginal shield fern (*Dryopteris marginalis*). The question involved with respect to this industry in relation to the possible depletion of the native supply of these ferns is apparently satisfactorily answered. Although the numbers of these ferns collected and sold in Boston and New York and other cities has increased enormously in the last twenty years, the price has not increased at all, an apparent certain indication that the supply is still ample. I am informed also that the methods of

collection involve care which probably does relatively little injury to the plants. A collector for example must break off the leaves carefully. Careless pulling would involve uprooting the stem which would make necessary the later trimming of the leaf bases. An additional point with respect to the Christmas fern depends on the fact that the fruiting leaves with their dimorphic tips are in general undesirable, so for this species at least the fruiting leaves are almost invariably left on the plant. For the other two species, it is a fact that in general, their spores are mature long before the collecting period, which falls largely in August or September. Thus the reproducing of new plants is amply provided for before the leaves are taken off. Not all the spores have been dropped however as may be realized when these leaves are used in table decoration. Laid flat on the table, they will very often leave a rather ample spore print on the white cloth.

Another item in connection with this industry is found in the fact that at least one source of supply is being discovered in Florida. Mr. Fred W. Fletcher, formerly of Auburndale, Mass., has transferred at least part of his activities to a Florida plantation, where he raises the leather fern (*Polystichum adiantiforme*) for shipment for this purpose.

Will not other fern lovers contribute from their experiences any facts of interest relating to particular species deserving protection in their localities, observations as to the decrease or increase of any kinds, the possibility of establishing new colonies, movements looking toward the establishment of sanctuaries, the passage of protective laws? The conservation of the wild is receiving a great deal of general attention at this time, so that any local action will receive the help that goes with concerted action. The Vermont law is reprinted here as a matter of record and as a suggestion for action in other states.

NO. 260. AN ACT TO PROTECT RARE PLANTS AND TO PROTECT THESE PLANTS FROM BEING SOLD FOR COMMERCIAL PURPOSES.

It is hereby enacted by the General Assembly of the State of Vermont:

Section 1. A person shall not take in any one year, except upon lands owned or occupied by him, more than a single uprooted specimen or two cuttings of each of the following plants, and then for scientific purposes only: fragrant fern, *Aspidium fragrans* Sw.; Goldie's fern, *Aspidium Goldianum* Hook.; mountain shield fern, *Aspidium spinulosum* Sw., var. *dilatatum* Gray; green spleenwort, *Asplenium viride* Huds.; wall-rue spleenwort, *Asplenium Ruta-muraria* L.; slender cliff brake, *Pellaea gracilis* Hook.; Braun's holly fern, *Polystichum Braunii* Fée; alpine woodsia, *Woodsia alpina* S. F. Gray; smooth woodsia, *Woodsia glabella* R. Br.; club moss, *Lycopodium annotinum* L., var. *pungens* Desv.; fir club moss, *Lycopodium Selago* L.; jack pine or gray pine, *Pinus Banksiana* Lamb.; calypso, *Calypso borealis* Salisb.; ram's-head lady's-slipper, *Cypripedium arietinum* R. Br.; green alder, *Alnus viridis* DC.; alpine willow, *Salix phylicifolia* L.; alpine willow, *Salix uva-ursi* Pursh; yellow mountain saxifrage, *Saxifraga aizoides* L.; alpine saxifrage, *Saxifraga Aizoon* Jacq.; mountain saxifrage, *Saxifraga oppositifolia* L.; Greenland sandwort, *Arenaria groenlandica* Retz.; vernal sandwort, *Arenaria verna* L., var. *propinqua* Fernald; northern comandra, *Comandra livida* Richards.; Lapland diapensia, *Diapensia lapponica* L.; hoary or twisted whitlow grass, *Draba incana* L.; black crowberry, *Empetrum nigrum* L.; northern gentian, *Gentiana Amarella* L., var. *acuta* Herder; hedsyarum, *Hedysarum boreale* Nutt.; butterwort, *Pinguicula vulgaris* L.; alpine mountain ash, *Pyrus sambucifolia* C. & S.; three-toothed cinquefoil, *Potentilla tridentata* Ait.; mountain shadbush, *Amelanchier Bartramiana* Roem.; few-flowered cranberry tree, *Viburnum pauciflorum* Raf.; pale painted cup, *Castilleja pallida* L.; lesser wintergreen, *Pyrola minor* L.; dwarf Canadian primrose, *Primula mistassinica* Michx.; dwarf bilberry, *Vaccinium caespitosum* Michx.; bog bilberry, *Vaccinium uliginosum* L.; cow berry, *Vaccinium Vitis-idaea* L.; mountain astragalus, *Astragalus Blakei*, Egglesst.; large-leaved goldenrod, *Solidago macrophylla* Pursh; alpine goldenrod, *Solidago virgaurea* L.

Section 2. A person who violates the provisions of this act may be fined not more than ten dollars for each plant or additional cuttings so taken.

Approved April 1, 1921.

BROOKLYN BOTANIC GARDEN.